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Hurricane Protection Decision Chronology (HPDC) Investigation

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Hurricane Protection Decision Chronology (HPDC)

Purpose & Scope

- Describe & explain chronological record of decision making for Lake Pontchartrain & Vicinity Hurricane Protection Project (LP&VHPP)
 - Document sequence of project decisions that resulted in system in place pre-Katrina
 - Provide an explanation, as opposed to an evaluation, of how Corps policies and organization, legislative, and financial and other factors influenced decision making for the LP&VHPP
- Intended to complement engineering performance focus of IPET, which provided critical answers to questions about what happened to the system during Katrina
- Along with IPET, expected to inform corporate institutional actions such as the USACE "Actions for Change" Initiative
- Report and source database url:
<http://www.iwr.usace.army.mil/inside/products/pub/hpdc/hpdc.cfm>

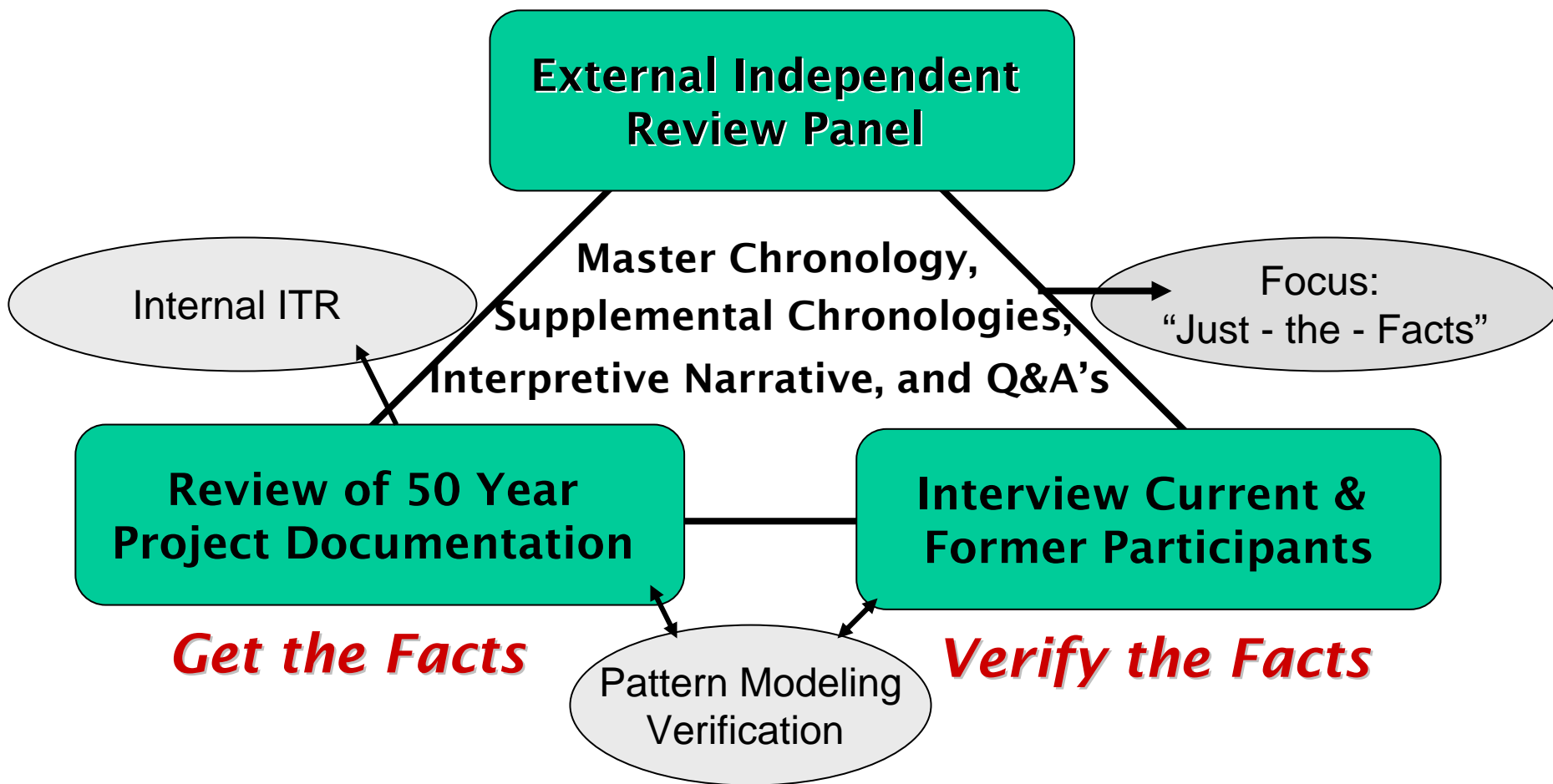
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Chronology Study : Forensic Approach

Synthesize the Facts



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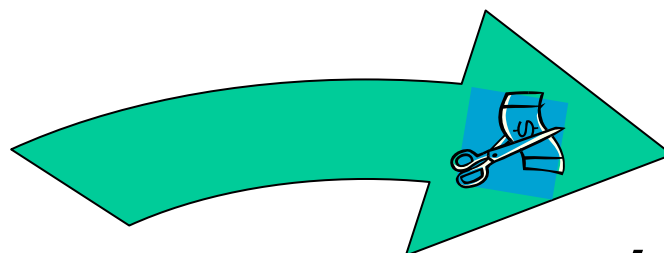
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HPDC Findings: Key Decision Influences

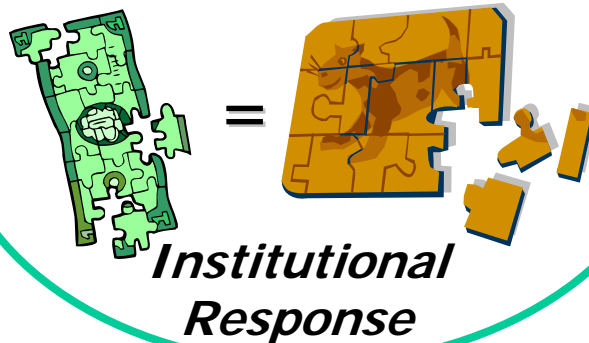
Tyranny of Incremental Decisions



*Loss of Vision for
an Integrated
System*



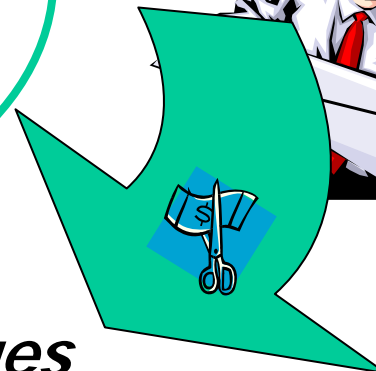
*Shared Sensitivity
to Cost Concerns*



*Lack of Dynamic Use
of New Information*



*Organizational
Decision-Making Issues*



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Eight Decisions Which Were Key to Understanding the Chronology

1. Project Designs Based on Standard Project Hurricane. 1962 SPH parameters used for the design of protective structures based on a rationale that this will best prevent catastrophic damage and loss of life.
2. 1966-68 Design Change: In response to Hurricane Betsy, design elevations of protective structures increased by 1-2 feet & Chalmette loop was added to the authorized plan as post authorization change approved by the Chief.
3. Treatment of New Information After Hurricane Betsy. Despite new information on storm intensity and advances in surge modeling, the SPH storm parameters and still water surge calculations used as basis for design were not updated subsequent to 1968.
4. Design Elevations of Structures. No changes to design elevations were sought subsequent to the 1969 post-authorization change report, with exception of lakefront project features which were adjusted based on 1984 Re-Evaluation Report shift to High Level Plan (see Decision No. 6 below).



Eight Decisions Which Were Key to Understanding the Chronology

(Continued)

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5. Geodetic Datum. 1985 decision to not update the relationship between the geodetic datum and local mean sea level to ensure that structures were constructed to the intended design elevations.
6. Post-authorization Change to the High Level Plan. 1985 decision to shift from Barrier Plan to High Level Plan, with resulting outcome ultimately being higher levees along lakefront in lieu of use storm barriers.
7. Congress Directs Parallel Protection along the Outfall Canals. Congressional language (1990 & 1992) directed parallel protection in lieu of frontage protection along the outfall canals and to allocate 70% of cost for parallel protection to federal cost share.
8. Issue of Revised Design Guidance for I-Walls. Decision to issue and apply revised design guidance for I-wall sheet pile design significantly reduced the cost of implementing the parallel protection alternative along the outlet canals.



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Seven Key Factors Which Influenced Project Decisions

1. **Concerns for Project Affordability.** Project designs were not adapted to reflect new information largely based on perceptions of federal and local fiscal constraints.
 - a. **Federal budget trends and competing priorities** for a shrinking share of the domestic discretionary budget in the face of increasing costs as post authorization changes were approved, created a climate where the Corps was reluctant to recommend costly design changes to accommodate new information.
 - b. **Local budget constraints** limited the local sponsors' ability to absorb increased cost-shares that would have been required to adapt the project to new information.
2. **Lengthy Planning and Implementation Period.** A succession of factors related to securing local sponsors, addressing the barrier plan concerns, and dealing with the problem of the outfall canals, combined to result in a protracted planning and implementation period which led to local sponsors insisting, not unreasonably, that the authorized project be completed before considering changes to project designs in response to new information.
3. **Diffusion of Decision-Making Authority.** Numerous challenges to the Corps water resources decision making eroded the agency's authority to act as a central decision maker, with no unifying analytical processes to track and, as needed, revisit the question of how the incremental decisions were affecting the intended project design, performance, and residual risk..



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Seven Key Factors Which Influenced Project Decisions ***(Continued)***

4. **Absence of a Formal Process for Evaluating Effects of Technical Decisions.** Where new information was recognized the Corps response was made within a risk-versus-cost tradeoff context, but without any formal analytical evaluation of the true quantitative risk and reliability implications of the tradeoffs.
5. **Organizational Decision-Making.** There is little evidence that direct technical consultation or communication, other than between the District and the Division, was made with HQUSACE on key critical technical decisions made following project authorization.
6. **Limited Processes for On-Going Evaluation and Reporting of Project Conditions.** The types of engineering assessments that would have been needed to identify and communicate potential problems associated with project performance were lacking, and the processes and funding to support inquiries that could have led to such requests was absent and outside the scope of the Inspection of Completed Works program (ICW) program.
7. **Communication of Project, Condition and Expected Performance.** The implications of design decisions to system reliability and residual risk were not effectively communicated to stakeholders as the project underwent changes over time, nor were the project's completeness, condition, or expected performance consistently assessed and reported to Washington D.C. decision-makers.



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HPDC – Bottom Line: Summary Findings

- ***Risk & Reliability.*** Neither a system-wide consideration of residual risk, or an explicit recognition of system reliability issues are evidenced in record. This includes lack of:
 - Adaptive treatment of risk & reliability over iterative design changes
- Clearly communicating residual risk and monumental scale of the consequences of failure to stakeholders and public



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Why Difference in Standards?

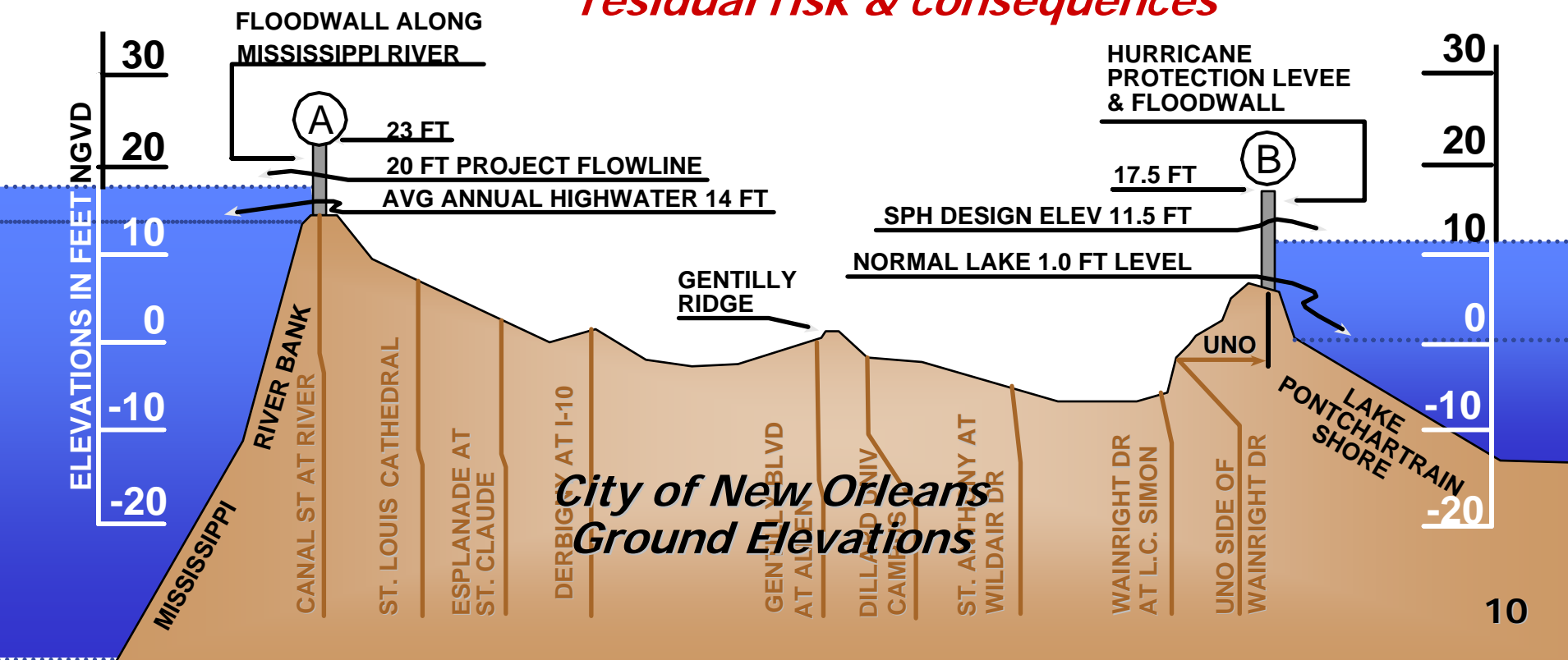
MR&T Project

~ 700 – 1000 Year
Design Level

LP&VHP Project

~ 200 – 300 Year
Design Level

- *Influence of cost considerations*
- *Loss of system perspective*
- *Inconsistent treatment of residual risk & consequences*

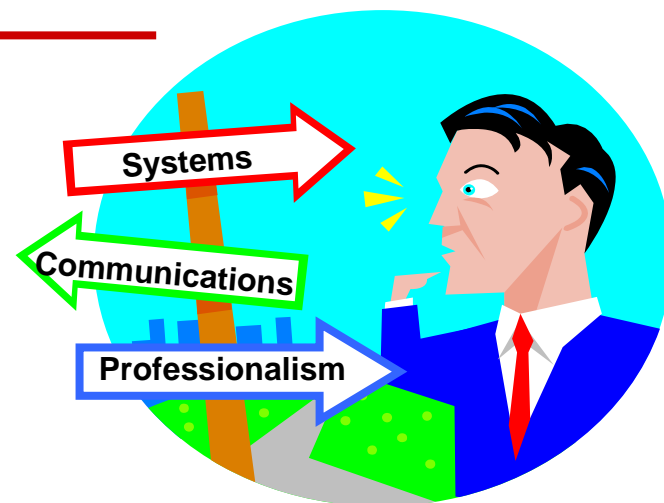




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Decision Chronology: Implications to “Actions”

- Comprehensive Systems Planning & Design
- Management Processes & Communications
- Public Service & Professionalism



Context for LACPR & “Actions for Change”

- ✓ ***Policy Summit*** - National dialogue and assessment of the unintended impacts of current process, policy, budgeting practices and cost-sharing legislation
- ✓ ***Doctrine, Process & Behavioral Transformation:***
 - ***Systems.*** Revisiting “big-picture” perspective during planning & design
 - ***Risk & Reliability.*** Evaluating implications during iterative design changes
 - ***Organizational Behavior.*** Internal decision-making processes, use of ITR’s
 - ***Communications.*** Sharing residual risk and consequences info to public
 - ***Technology.*** Dynamic use of new knowledge throughout project life-cycle

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Chief's Actions for Change

- **Employ integrated, comprehensive and systems-based approach**
- **Employ Risk-Based Concepts in Planning, Design, Construction, Operations and Major Maintenance**
- **Continuously Reassess and Update Policy for Program Development, Planning Guidance, Design and Construction Standards**
- **Dynamic independent review**
- **Employ Adaptive Planning and Engineering Systems**
- **Focus on Sustainability**

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Chief's Actions for Change (continued)

- **Review and Inspect Completed Works**
- **Assess and Modify Organizational Behavior**
- **Effectively Communicate Risk**
- **Establish Public Involvement Risk Reduction Strategies**
- **Manage and Enhance Technical Expertise and Professionalism**
- **Invest in Research**